3. MAJOR PERFORMANCE AUDIT FINDINGS AND RECOMMENDATIONS

These results are presented for each of the five focal points designated by the GPAC Technology Subcommittee:

- Governance of technology
- Technology planning
- Technology management
- Telecommunications
- SIPS

Governance of technology

Governance is the means by which the users of technology, the providers of technology services, and agency management work together to make decisions that serve the best interests of the State through the effective use of technology. Governance consists of both an organizational structure and a related process based on management procedures.

Finding 1 -- The ITC has not been effective in its oversight of technology.

The General Assembly created the ITC and expects it to set policy and provide management oversight of information technology activities of the executive branch agencies, as well as SIPS.

Because of statutory and organizational linkages, the ITC has been too close to SIPS. The ITC has narrow statutory duties that are tightly interconnected to SIPS. Similarly, the statutes require SIPS to obtain the advice and consent of the ITC for most of its duties. Organizationally, the ITC has relied on SIPS to set its agenda and to provide staff support.

The ITC has also been too far removed from the agencies because there are no operational nor statutory linkages between them. The only required connection is the annual submission of an agency technology plan.

Under this management structure and legislation:

- The ITC has approved certain policies recommended by SIPS, although some of the affected agencies had significant, legitimate exceptions to those policies. Procedures provide any agency the right to request a hearing before the ITC. However, in practice,

many large agencies have considered the ITC to be generally insensitive to their interests and have, therefore, chosen not to exercise that right.

- The ITC has approved State Computer Center billing rates recommended by SIPS, although some of the affected agencies had significant, legitimate exceptions to those rates. Again, some agencies chose not to petition the ITC. In fiscal year 1991 these rates generated gross revenue that exceeded current operating cost by approximately $9 million or 36 percent. Despite the review and approval process, this level of reserve generation apparently surprised some legislators.

- Numerous agencies have undertaken major information technology investments without involving the ITC in any direct manner. In fact, many agencies today feel that they are not required to interact with the ITC and that the ITC cannot provide them any value regarding their technology initiatives. Thus, there are no operative lines of responsibility and authority over technology resources. When an agency's investment does not pay off as promised, there is no generally significant consequence -- the agency just makes another appropriation request the next year. For example:

  - An agency, based on a vendor's suggestion, bought a number of portable computers so that personnel traveling throughout the State could dial into the SIPS State Computer Center to send and receive case work data. At the time, the State Computer Center did not support dial-in access to its computer because of ITC policy regarding data security. Therefore, the portable computers were never able to be used. The agency spent the money without contacting SIPS to confirm that the vendor's idea was feasible.

  - An agency was interested in providing an integrated office automation system to support its operations statewide. To examine the need for the system, it formed a task force of ten people. The task force recommended a $40 million five-year project for office automation for one agency and specified one vendor's hardware and software, even though the detailed requirements analysis had not yet been completed. Three of the ten task force members were employees of that vendor.

  - An agency undertook a three-year project to develop a new payroll system for its staff statewide at the direction of the General Assembly. The agency used SIPS to program the new system. After two years and approximately $1 million of charges, the General Assembly determined that the design was flawed, that the system would not be completed within the three years, and that it would never work. The General Assembly cancelled the project.

- Members of the ITC have expressed the opinion that the ITC has seldom acted on substantive issues and usually provides only perfunctory approval of the annual plan and SIPS' policies and billing rates. In the past two years, the only controversial

issue brought to the ITC was the Employment Security Commission's request to acquire its own mainframe computer.

- Since creating the ITC in 1983, the General Assembly has not looked to the ITC for any accountability regarding the use of information technology in the executive branch. In fact, the first time it called on the ITC directly was in 1991 to address concerns about a plan at the Department of Revenue to acquire a new mainframe computer. The ITC previously had not been involved in this issue.

Recommendation -- Restructure governance of technology to provide clear-cut accountability and a well-defined chain of command.

The proposed governance structure and its components are illustrated in Exhibit 3-1. Appendix A provides detailed descriptions of each component. The State should restructure governance of technology as follows:

- Establish an Information Resource Management Commission (IRMC) to replace the existing Information Technology Commission. The IRMC will have responsibility to approve executive agency technology plans and budgets, statewide technology strategies and policies, billing rates, and material expenditures by SIPS.

  It will also have authority to fund statewide technology initiatives and to temporarily interrupt funding of agency technology projects that have been independently judged at risk of failure.

- Designate the Deputy Controller for Information Resource Management to be the Chief Information Officer with coordinating responsibility across executive agencies and with responsibility and authority to:

  Assure an effective linkage between statewide technology plans and strategies and executive agency programs and service delivery needs

  Assure the effective delivery of SIPS' services to support agency programs

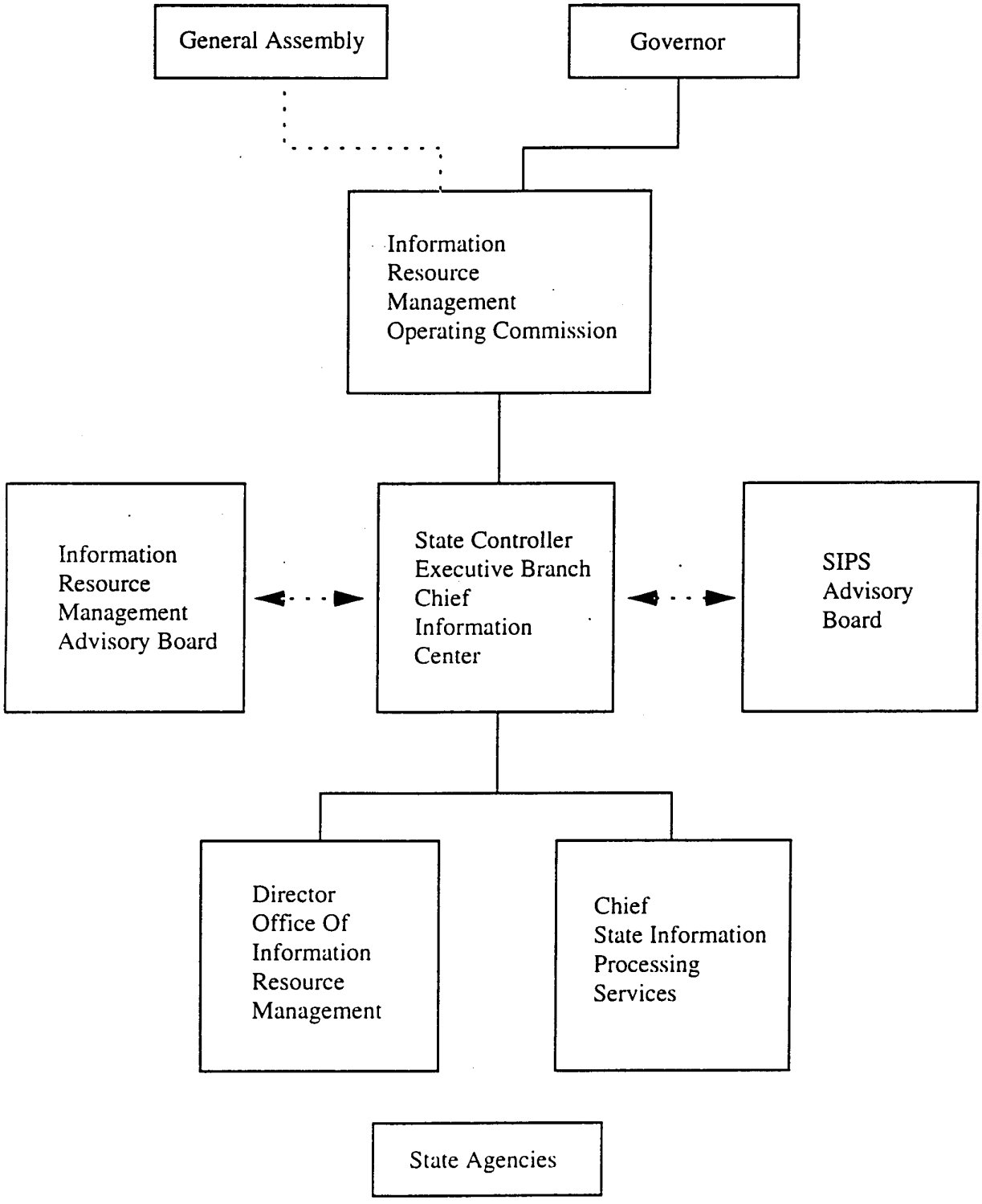
  Assure the successful completion of all major technology projects

  Implement directives from the IRMC

  Coordinate executive agency IRM activities appropriately with the IRM functions of the judicial and legislative branches and the University of North Carolina and community college systems

  The CIO is the central point of accountability for the effective management of the State's technology resources.

Exhibit 3-1
Information Resource Management
Governance Structure



- Establish an Information Resource Management Advisory Board to link agency programs, technology plans and service delivery needs. The Board will advise the CIO on program requirements that must be preserved and supported by the statewide technology plans and strategies.

- Authorize the existing SIPS Advisory Board to advise the CIO on SIPS' operations and service levels required to support agency programs effectively, and to advise and approve of SIPS' billing rates.

- Establish an Office of Information Resource Management reporting to the CIO to be responsible for coordinating technology plans across agencies to achieve integration among systems and developing statewide technology plans and policy.

This governance structure will empower the senior technology management oversight body with the authority and resources necessary to accomplish its mission: *the responsibility and accountability to the State government and to the taxpayers of North Carolina for the effective planning and implementation of technology resources by and for executive agencies.* Its potential benefits for the State include the following:

- Enhance program efficiency and service delivery through establishing a statewide alliance to link technology capabilities and plans with business missions and strategies. It will:

  Link each agency's IRM funding requests to its program plans

  Assist the agencies in obtaining the appropriate level of IRM funding for necessary resources and services

  Motivate and facilitate the State agencies to combine and share scarce, expensive resources, particularly skilled technical personnel, and to share past experiences to avoid future pitfalls and achieve maximum benefit from investments in technology

  Motivate the agencies to balance self-interests against mutually gained advantages available through common, uniform approaches to technology planning and management

  Foster integration of systems across agencies and branches

- Focus IRM services on the needs of the client agencies by establishing a partnership between SIPS and its clients to:

  Achieve effective management control over operating costs of shared technology resources

Provide for client review and approval of billing rates so that charges will be equitable and fair and reflect the actual costs incurred

Plan and manage the accumulation of an appropriate reserve allowance to fund investment in expensive shared resources, and to make new, cost-justified technology available to the agencies expeditiously

Assure that the quality and level of services from shared resources are responsive to requirements, delivered on time, and reliable in performance

- Reduce risk of major or critical technology investments failing to achieve expectations and deliver value. It will:

  Provide a quality review function for major IRM related projects and investments to assure that actual expenditures are reasonable and that results, timetables, and benefits meet expectations

  Manage expenditures for major assets judiciously and prudently to obtain the greatest long-term benefits from cost effective investments

Finding 2 -- The Employment Security Commission is inadequately represented on the SIPS Advisory Board.

The SIPS Advisory Board, by its very essence, is intended to provide counsel to SIPS from its many client agencies. Because of their organizational interrelationship and past decisions, the Department of Economic and Community Development and the Employment Security Commission share one position on the board, each holding the position in alternating years. For the past few years, ESC has been one of SIPS' largest clients, both in terms of resource consumption and billings. It is wholly inappropriate today for ESC not to be continuously represented on the board.

Recommendation -- Designate the Employment Security Commission to have its own regular position on the SIPS Advisory Board.

The Department of Economic and Community Development, apart from ESC, should be treated in the same manner as other small agencies.

Finding 3 -- IRM reports to an Assistant Secretary in most agencies.

The organizational positioning of the information technology function is important because it typically affects the extent to which the technology is used in program operations. Some of the agencies that have made the broadest and most effective use of information technology have the IRM manager report at relatively high levels:

Agency	Oversees the IRM Manager
Department of Human Resources	Deputy Secretary
Department of Public Instruction	Deputy Superintendent
Administrative Office of the Courts	Director

At each of the other agencies, the IRM manager reports to an Assistant Secretary, who typically oversees four to six other support functions.

When information technology reports to an administrative division within an agency, it tends to be viewed as a support function. The technology can be powerful and valuable in that role, but its potential is much broader.

Information technology can enable a program to operate in significantly different ways and to perform functions that it cannot handle manually. However, it is unusual for the technology to be used so ambitiously unless the Assistant Secretary for a program appreciates that it offers more than just clerical automation and drives toward that objective. Having a Deputy Secretary oversee information technology as an enabler for the agency can sometimes open other Assistant Secretaries' eyes to the opportunities in agency programs.

Recommendation -- Establish supervision of the IRM at either the Secretary or Deputy Secretary level of each agency.

Making an administrator at the Secretary or Deputy Secretary level responsible for the IRM function can potentially provide several benefits to the agency:

- The agency may be better organized to coordinate information technology initiatives across its divisions and programs
- More valuable uses of information technology may be found for more programs

The governance process

The governance process defines procedures for each of the critical management stages of a technology initiative:

- Planning
- Funding
- Spending
- Monitoring

- Controlling

Technology planning is one of the designated focal points of the performance audit and is addressed separately from the governance process.

Finding 4 -- Major appropriation requests for information technology often are not effectively managed.

The most explosive and necessary growth in information technology costs in North Carolina comes from the demand for new application systems. Unfortunately, agency appropriation requests to support these demands frequently raise serious concerns. For example:

- The 1992 Department of Correction request for assistance in replacing its existing systems was based primarily on a requirement for 50 new permanent positions for computer programmers.

  The request did not address the diverse skills required to undertake such a project, it begged the issue of the different staffing levels and mixes required at different stages of a systems development project, and the number of permanent staff that will ultimately be needed to maintain the new systems. The proposed solution was too simplistic for the department's complex problem.

- The Department of Revenue needs to replace its existing tax systems and requested approximately $2.5 million towards the implementation of a new Integrated Tax Administration System. The Department faces a lack of confidence from the General Assembly as a result of problems on prior technology projects. Its goals and arguments are strong, but its presentation of supporting plans has not overcome the credibility gap.

Recommendation -- The IRMC should establish minimum standards for all appropriation requests to the General Assembly for information technology funding.

The objective is two-fold:

- Assure that every appropriation request not only addresses a valid need, but also demonstrates a well-managed foundation of appropriately detailed planning and prudent technical, financial, and organizational management

- Standardize the presentation format of technology appropriation requests to the General Assembly, which should facilitate its evaluation process and expedite its appropriation hearings

The IRM Office should work with the SIPS and IRM Advisory Boards and the State Computer Services Study Commission to develop the standards and presentation formats. which should then go to the IRMC for approval.

Finding 5 -- North Carolina is affected adversely by long term technology projects losing funding midstream.

As an example, the State Accounting System (SAS) project has been affected by lapsed funding across budget years. The project began in 1988. It was planned to require several years to implement statewide. SAS has now been implemented at the Office of State Controller and the Department of Public Instruction. The implementation effort for the remaining agencies has been suspended since July 1991 reportedly because of the lack of appropriated funds. Other currently planned large projects such as the Drivers' License System and the Child Support System could be similarly affected.

The General Assembly exercises financial control by determining the extent a project is to be supported through appropriations. If the General Assembly intends to authorize a project through its completion, then an unintended interruption caused by constraints of the budget process is likely to be detrimental.

North Carolina currently funds long-term capital projects, including construction of facilities, on a pay-as-you-go basis. One aspect of that practice is that it is likely to create delays in completing capital projects when funds become limited, as they have over the past few years. Delays frequently have an adverse impact. However, a significant delay to the implementation of a major information system can literally put the successful completion of the project at risk:

- Operational information requirements change
- Technical constraints and requirements for integration with other systems change
- The professional staff that developed project expertise as a team frequently cannot be reassembled to continue the project
- Increases in the project budget become almost inescapable
- User interest, project knowledge, and commitment are difficult to recapture

Recommendation -- The General Assembly should develop a process for multi-year funding of technology projects.

The General Assembly should consider applying principles of the State's capital budgeting process to large information technology projects. There is potential benefit to the State from avoiding unnecessary risks in these projects by recognizing their long durations and committing to fund them to completion, contingent on satisfactory progress and other appropriate controls.

Finding 6 -- Agency spending on information technology often appears to be inadequately managed.

In numerous incidents of spending on information technology, questions have been raised about the amount of management and control that were applied. For example:

- SIPS recently upgraded its mainframe computer at a cost of approximately $9 million. The cash had been accumulated over the past few years in the State Computer Center reserve fund, which exists for the purpose of financing such upgrades. SIPS went through its routine approval process with the ITC. Despite the magnitude of the cost, the approval process does not require SIPS to make presentations to members of the General Assembly. SIPS was persuaded to make presentations to the Computer Services Study Commission and the Government Operations Committee late in the upgrade decision process.

- In May 1991 the Transportation Data Services Center (TDSC) at the Department of State Transportation, was making a substantial purchase of personal computer hardware/software. While the purchase has proved to be effective, insufficient management information was available to support the number of computers being purchased and the advanced technology being specified. Apparent issues included:

  TDSC had accumulated an inventory of 119 personal computers and 109 printers to support 62 filled positions.

  TDSC had standardized on a proprietary personal computer technology (micro channel architecture designed by IBM) that lacked apparent business justification and cost DOT approximately $500,000 more than regular personal computers.

- In June 1992, an agency submitted a request for approximately $20,000 for two personal computers and related software. A legislator, having recently purchased a comparable personal computer for himself for less than $4,000 including software, questioned the price. Preliminary review suggested that the purchase was more expensive than necessary by at least several thousand dollars.

Examples like these abound. Effective management practices should prevent most of them, bringing the justification, the purchase, and the price into realistic balance.

Recommendation -- The IRMC should establish procedures for purchasing and should approve significant technology expenditures.

The IRMC should:

- Solicit a recommendation from the IRM Office and the IRM and SIPS Advisory Boards, establishing standards for the explanation and justification of technology purchases and corresponding review proceduress

- Establish thresholds or categories of technology purchases that would automatically be subject to IRMC approval

The standards should enable the agencies to practice prudent management over their technology expenditures, and the approval process should serve as incentive for them to apply the standards.

Finding 7 -- Consolidated financial information about agency technology efforts and assets is not readily available.

When the General Assembly attempted to obtain information about the State's cost for purchasing personal computers last year, it was stymied. It could identify an expenditure of approximately $60 million, but it could not get a breakdown by agency. It is generally acknowledged that neither the departmental accounting system nor the Purchase and Contracts system is capable of providing that level of management information.

Standard financial reports for an agency are summarized at object of expenditure level and commingle figures for various projects or initiatives. Financial management reports on technology, if and when they are prepared within an agency, are seldom shared with other State management concerned about technology. Also, such reports are difficult to assemble on a departmental basis because technology funds for division programs are appropriated at the division level. The result is that the State knows how much it spends on technology, but not enough about where and how well the funds are spent.

Recommendation -- Appropriate technology funds at the department level and require the IRM manager to report quarterly on agency technology expenditures and activities.

Appropriating the funds at the department level will facilitate the collection of agency-wide expenditures on technology without interfering with each division's authority and control over its appropriated funds. The agency IRM manager should then be able to collect the necessary financial information directly for all divisions under his cognizance and assemble his report to the IRMC. The report serves at least two purposes. It will give the IRMC a view of the State's technology activities throughout the year. It will also give the IRM manager a better view of his agency's technology activities and should facilitate coordination and support across the divisions.

Finding 8 -- There is no independent reporting on project status and results.

As a necessary and appropriate management procedure, an agency running a project gets periodic status reports from its project team. However, from the standpoint of assuring the successful completion of the project, such status reporting lacks the independence required to render an objective assessment of it. Also, no reported post-implementation assessments were completed to evaluate the results achieved through technology initiatives.

Recommendation -- The IRMC should institute a quality review program to monitor the progress of major/critical technology projects.

The need for a statewide quality assurance function is discussed elsewhere. This recommendation focuses on the accountability for assuring effective management of key technology projects.

The quality review program, as it applies to a single technology project, consists of a planned series of brief, independent management and technical reviews conducted periodically over the life of the project. Assuming some standard life cycle methodology for such projects, the reviews would be scheduled to occur near the completion of each life cycle phase. For example, reviews would take place near the end of planning, feasibility study, requirements definition, design, etc. A minimum of three reviews per year should be held following the inception of the project.

The purpose of each individual review is to verify that the project is making reasonable progress according to plan, and that there are no apparent situations that would likely cause the project to fall behind schedule, exceed budget, or otherwise fail to reach a successful conclusion. If a review identifies such potential problems, a series of corrective actions and objectives sufficient to eliminate or circumvent the risks would be recommended.

The reviewers must be independent, both in fact and in appearance, to substantiate the objectivity of their findings, positive or negative. The reviewers must also have the necessary experience and expertise in the program area, project management, and technology to substantiate the validity of their findings. This requirement suggests that reviewers most often would be contracted from qualified and independent vendors, from North Carolina private sector enterprises, or from other states.

The quality reviews could be financed by requiring each technology project appropriation request to include an incremental budget item to cover the mandated reviews.

The IRMC would be the sponsor of the review, not the agency conducting the project.

This process objectively identifies potentially serious project risks and brings them to light as early as practical in the project life cycle. It presents the situation in non-technical terms to most of the management bodies that might contribute to its resolution. Subsequent reviews will keep the matter in the spotlight until it has been resolved.

The recommendations above should be sufficient to enable and motivate agency management to take advantage of the available procedures and resources to help them manage their technology projects to successful completion. But there could be situations where the IRMC needs additional power of persuasion to gain the needed attention from agency management.

Recommendation -- The IRMC should temporarily freeze appropriated project funds if the project is at risk and agency management has not committed to taking corrective action to resolve the issue.

In the scheme of a major agency, a potential risk to a several million dollar technology project may reasonably be one of the agency's lesser problems. But it still needs to be addressed in the short term to protect the State's long term interests.

The IRMC, as a means of raising the priority of the issue with agency management, should have the authority to impose a temporary freeze on the funds appropriated for the continuation of the project. The purpose of the freeze is to persuade agency management to commit to taking the recommended corrective actions, or other appropriate corrective steps, in a timely manner. The IRMC could impose the freeze with a discretionary delay of from 7 to 90 calendar days to give agency management sufficient time to respond. It can lift the freeze immediately upon its satisfaction that the agency is taking the appropriate management steps.

Based on informal discussion with legislative counsel, there are no apparent constitutional or statutory prohibitions to the IRMC having this type of control over appropriated funds.

Finding 9 -- State management's discussions about SIPS' finances often create miscommunications that inhibit effective decisions.

The financial aspects of SIPS' operations are of critical interest to virtually everyone. However, discussions about them tend to start with financial statistics from multiple sources. The statistics sometimes appear to be conflicting, causing frustration. For example, the following contradictory viewpoints have come forth at meetings of the State Computer Services Study Commission:

- SIPS' continually declining billing rates indicate its effective stewardship of technology resources. Yet agencies complain that their current bills for SIPS' services are too high.

- The General Assembly is surprised by and suspicious of the levels of reserves that SIPS accumulates. However, the Real Decisions study indicates that SIPS is one of the lowest cost providers of computing services among comparable organizations.

Reconciling these apparent discrepancies is a prerequisite to understanding SIPS' finances and to making effective management decisions about them.

Recommendation -- Establish standard financial terminology and statistics regarding technology resources to facilitate effective management.

The IRM Office, in conjunction with SIPS, the SIPS Advisory Board, and the IRM Advisory Board, should develop a glossary of financial terms and corresponding statistics that are necessary for discussion of SIPS finances and broader IRM financial issues statewide. The terms and financial statistics should then be presented and explained to each of the management groups, such as the IRMC, agency management, and the State Computer Services Study Commission, that need to apply them in managing the State's IRM resources. The glossary needs to define, clarify, and provide examples of various technical and financial concepts and terms. A sample glossary is included as Appendix B.

State management should then prepare to deal with the substantive issues in technology management by selecting the financial terms and statistics appropriate to the issue in question.

Finding 10 -- The IRMC has to deal with the issue of agencies going outside of SIPS for data processing.

This has been an issue since the Departments of Revenue and State Treasurer retained their mainframe computers during the original data center consolidation that created SIPS. It has been raised anew by the ESC's more recent request to again acquire its own mainframe computer, and by the recent growth of "outsourcing," which refers to contracting with a vendor to perform all data processing related services.

Many agencies already have and use non-mainframe alternatives to SIPS. For instance, the agencies operate approximately 170 mid-range computers, e.g., IBM AS/400s, Data General MV Series, and DEC VAXs so some agency programs clearly do not rely on SIPS to perform their data processing. Also, the industry direction is toward distributed applications with client/server architectures, i.e., more personal computers and local area networks to support major application systems.

Each agency must be held accountable for the operational and financial performance of its programs. If policy prohibits an agency from seeking mainframe alternatives to SIPS to process its programs, then it lacks requisite control for full accountability. If the agency can present a case to the IRMC that its programs would benefit operationally or financially by using an alternative source of computer processing instead of SIPS, the IRMC should make a decision on that request in light of its impact on the agency and the State.

The ultimate objective is for SIPS to perform at a level that makes it the best alternative for the agency. Granting agencies this option would give SIPS a strong incentive to remain competitive.

Recommendation -- The IRMC should establish a policy regarding agencies using alternative processing sources to SIPS.

The IRM Office, working in conjunction with the IRM and SIPS Advisory Boards and SIPS, should draft a policy for review and approval by the IRMC. North Carolina should determine whether, and under what conditions, other sources of mainframe processing should be authorized as an alternative to SIPS. Therefore, the policy should explicitly include outsourcing.

The State of Vermont recently surveyed all of the states on their use of outsourcing to replace central data processing. The results were summarized in the Spring 1992 issue of the NASIRE newsletter, *Exchange*. Forty-four states responded. Among them, Vermont found that:

> None of the 44 states outsources its central data processing.
>
> Nine states have not even considered outsourcing.
>
> Twenty-four states have considered outsourcing but rejected it.
>
> Ten states have not rejected outsourcing entirely; some use it for limited functions and others are still evaluating it.

Technology planning

A primary thrust of the recommendations on technology planning is to integrate technology planning and funding with program planning and funding, including program plans, technology plans, and budgets for both.

The performance audit report on program budgeting and evaluation points out that North Carolina's program planning process and program budgeting process are not sufficiently integrated. While there is a current initiative to link these two processes through the Office of Planning, it only began in 1991 and is still at a very formative stage. For all practical purposes, the State has not yet accomplished this first linkage.

Finding 11 -- The planning process for technology is ineffective, uncoordinated, and not integrated.

The planning process and resulting plan have several problems associated with them:

- Many agencies do not take this planning process seriously, as is evident by the condition and format in which input is provided to SIPS. For example, Department of State Transportation's plan last year was submitted as hand written updates to their prior year's plan. The project budget estimates provided by some agencies either

show the same amount for each project or the same broad range for all projects without explanation (e.g., Departments of Human Resources, Crime Control and Public Safety, and Community Colleges). Furthermore, four senior IRM employees flatly stated that in their opinions statewide IRM planning does not exist.

- SIPS has given inadequate priority or resources to the development of the IRM plan. SIPS has allocated only one and one-half professional full time equivalents (and one and one-half clerical positions) to developing and maintaining statewide IRM planning, policies, and procedures. It also has frequently redirected these resources to other SIPS-related studies.

- There are no detailed plans concerning actions SIPS will be taking based upon the needs of its client agencies. Apparently, prior to the 1990-1991 Plan, SIPS had been preparing its own written planning statement for the IRM plan at the same time that the agencies prepared theirs.

- The IRM Strategic Direction Document, a high level statement of the direction SIPS believes the State should be taking, is prepared solely by SIPS. It also reflects SIPS' apparent central processing biases.

- There are only limited reviews of the individual agency's submissions for compliance with the State's IRM policies and guidelines, and the planning document does not state which agency's plans do or do not comply.

- The planning process does not try to identify any statewide or multi-agency issues or needs, nor does it identify potential statewide initiatives for the benefit of the State. Since each agency's plan is prepared independently, this lack of coordination across agencies has allowed the State's systems to evolve without sufficient integration. Therefore, the State suffers from system redundancies and inability to obtain timely, accurate, and thorough information.

- The ITC is required by law to present the annual information technology plan to the General Assembly on the first day of each session. For the 1992 session, which convened on May 26, the annual technology plan had not yet been published on May 13. Obviously, there was not sufficient time for the ITC to conduct any form of constructive review of the statewide plan.

Recommendation -- Modify the planning process at the agency level to link technology plans to program objectives.

The information technology planning process at the agency level should be modified as follows:

- Each agency IRM manager should participate directly in agency planning activities as a basis for developing the technology plans, as follows:

  Participate in the division's program planning activities to offer guidance on technology matters, to coordinate the technology aspects of planning across divisions, and to identify opportunities for systems integration across agencies

  Prepare an agency technology plan that supports the divisions' program plans and submit that plan to the IRM Office for statewide coordination

  Report quarterly to the agency IRM advisor and to the CIO on progress against plans for technology initiatives, and obtain information from divisions as necessary

- Each agency should be required to assign a deputy secretary or division head (other than the IRM manager) to the IRM Advisory Board. This individual would be responsible for assuring that the agency's technology plans and the departmental technology plan each provide the necessary support to agency programs. This person would also be responsible for interacting with the IRM Office to assure that the statewide technology plan supports agency programs.

- IRM policies should be updated to require every agency to prepare a formal feasibility/cost-benefit study supporting the justification for any project contained in its annual technology plan above a specific budget threshold. IRM procedures should specify the content and format of such studies based on their size and/or mission criticality.

Recommendation -- Reconstruct the planning process at the statewide level.

The information technology planning process at the statewide level should be reconstructed as follows:

- SIPS should be required to prepare an annual plan in support of agency program operations and submit it to the IRM Office for review and statewide coordination.

- The IRM Office should be required/authorized to:

  Review agency technology plans to ensure compliance with policies, guidelines, and statewide strategies.

  Identify opportunities and requirements for the effective coordination of agency technical plans, including integration of systems across agencies and potentially across branches.

Recommend common support needs for centralization or as potential statewide initiatives, if appropriate.

Publish a consolidated IRM plan for the State including agency technology plans, SIPS' plan, and statewide technology initiatives.

Provide technology planning support to agencies, on request.

- IRMC should be responsible for resolving planning problems across agencies or between an agency and the IRM Office. It should also approve the final technology plans for each agency and for SIPS or note its reasons for non-approval.

- The General Assembly should be responsible for supporting the IRMC's planning authority. It should postpone consideration of appropriation requests for technology on which the IRMC has not yet reviewed the supporting plan.

Recommendation -- Planning documents should be made more specific and more detailed.

The planning documents, the Automated Information Processing Report and Plan and the IRM strategic direction document, should be modified as follows:

- Each technology initiative in an agency, division, or SIPS plan should be supported by a well-documented project statement that includes each of the following components, as appropriate:

  Goal or purpose associated with supporting program

  Measurable objectives that define the successful achievement of the goal

  Description of the technology and its planned function

  Anticipated benefits

  Planned completion date for the initiative

  Quarterly project milestones for the first year

  Estimated annual budget for outside services, hardware, and software through the completion date

  Personnel requirements to support the effort

  Estimated annual operating cost, if applicable

- The IRM strategic direction document should be a specific plan, based on the agency technology plans, for conducting and implementing statewide information technology initiatives for the benefit of the State. It should be prepared by the IRM Office in a joint effort with SIPS and the agency IRM managers.

Technology management

Other pervasive technology management issues among the executive agencies or across the branches of government warrant discussion on a statewide basis.

Finding 12 -- Current conditions of information technology vary widely among the agencies and some are detrimental to the State.

Some agencies have achieved significant results through information technology. For example:

- The Employment Security Commission has successfully leveraged information technology to increase its services and reduce its staff level over the past five years. It provides most of its services on-line to its clients.

- Department of Public Instruction has successfully implemented a Uniform Educational Reporting System that operates at each of the 132 local education agencies.

- SIPS operates the North Carolina Integrated Network, a statewide backbone telecommunications network for voice and data.

However, other agencies have experienced varying degrees of difficulty in reaching or maintaining top quality in their information technology functions:

- As a result of many years of insufficient attention to the maintenance of their systems, departments such as Correction, Revenue, State Transportation, and Environment, Health and Natural Resources, rely on antiquated application systems. These systems are no longer sufficiently reliable to support daily operations of mission critical programs. They generally:

  Do not adequately meet daily operating needs

  Are inefficient and prone to errors

  Are difficult and costly to maintain

  Use outdated technology (ALC, MACRO CICS, ADF) for which no experienced personnel can be recruited

Depend heavily on the expertise of the few remaining staff that developed them

Risk extended periods of outage for mandatory corrections or changes

- The Department of State Treasurer recently invested in a state-of-the-art IBM ES/9000-135 computer, but has not made the incremental investment in an uninterruptable power supply system (UPS) to protect the computer from power surges.

  During April 1992, there was a confirmed power surge that led to the electronic failure of numerous components of the computer system. These failures cost the department significant time for their personnel, disruption of their regular daily processing, and approximately $40,000 of repair costs that fortunately were still covered under warranty.

There are also significant differences in relative levels of IRM support among the agencies. Exhibit 3-2 compares the agencies in terms of their respective budgets for IRM support, and Exhibit 3-3, in terms of staffing levels.

Recommendation -- The agencies facing operational risks should immediately prepare plans and assess the value of greater investments to reduce and eventually eliminate these risks.

To varying extents, this process is underway. Revenue and Transportation have plans to implement completely new systems. Correction recognizes the problem but has no corrective plan in place yet. Environment, Health and Natural Resources also has no corrective plan in place yet. It will take years to fully correct existing limitations. In the interim, each agency should look for short term solutions that would lessen its risks.

These agencies also need to actively assess whether or not investing a greater proportion of the budget in information technology to support their program operations would be justified. Based on the experience of the more technically advanced agencies, these less advanced agencies may actually be paying a significant opportunity cost for not making more effective use of information technology. They may need to begin investing more in their information systems now to achieve future savings in program operations based on increased efficiency and productivity.

Finding 13 -- Technical experts on agency IRM staffs tend to be underutilized.

SIPS focuses most of its technical support for application systems primarily on mature IBM mainframe technology. Over the last few years, the industry has brought a wealth of additional and alternative technologies to the point of general business applicability, e.g., local area networks (LANs), client/server architectures for distributed computing, open systems under UNIX, and others. Within its budget constraints, SIPS has offered limited support in selected areas of these new technologies. However, several agencies concluded that they needed more technical expertise than SIPS could provide.